

Cost Estimates Skyrocket for Hanford Tank Vitrification Project

The \$6.9-billion cost estimate for the privatization project to convert Hanford tank wastes into glass has risen sharply, with a new estimate by BNFL Inc. coming in at around \$15.2 billion. And this figure does not include the \$1.5 billion that might be added to the project if polychlorinated biphenyls (PCBs) in the tank waste are going to be subject to regulation by the U.S. Environmental Protection Agency.

Hard costs for the project have now been estimated at \$6.4 billion. The additional costs come from the price of borrowing money, more than doubling the project costs. These financing costs stem from the fact that under the U.S. Department of Energy's privatization contract with BNFL Inc., the company pays all up-front costs, and the DOE begins to reimburse the company only when it begins to deliver vitrified waste. That will not take place until 2007, and so BNFL Inc. must finance the project completely until then.

In the wake of the cost increases, both the DOE and BNFL Inc. are looking at alternatives to the original privatization plan. These alternatives include:

- Changing the way the DOE pays BNFL Inc. under the privatization contract. If the DOE began making payments sooner, BNFL Inc. estimates the project costs could be trimmed to \$10 billion.
- Switching to a more conventional contract. Under this proposal, the federal government would pay the project's costs with annual appropriations. The contractor would receive income based on some sort of incentive program.
- Removing BNFL Inc. from the project and putting it out for bid again—whether under another privatization contract or under more traditional funding.

An agreement between the DOE and the state of Washington on the tank waste cleanup calls for the DOE to sign a contract by August 24, to begin construction in 2001, to begin vitrification in 2007, and to finish vitrifying the most radioactive 10 percent of the waste by 2018.

President Vetoes Nuclear Waste Bill; Senate Override Attempt Fails

This year's version of a nuclear waste bill has passed the U.S. Senate and House of Representatives but was vetoed by President Clinton on April 25. A Senate attempt to override the veto failed on May 2.

The nuclear waste bill, S. 1287, which amended the Nuclear Waste Policy Act of 1982, mandated that the U.S. Department of Energy begin accepting waste at a temporary holding facility as early as 2007. It also delayed the timetable for the U.S. Environmental Protection Agency to set allowable limits for radiation releases until after the current administration has

left office and repealed the 70,000-metric ton storage restriction placed on a first repository. The DOE's current timetable puts 2010 as the earliest it could begin accepting waste at an approved repository, assumed to be at the Yucca Mountain site currently being characterized.

According to reports, the Clinton administration objected to the delay placed on the EPA's establishing radiation protection standards, as well as to the "early receipt" provisions of the bill. It also expressed concerns with liability issues, transportation provisions, and what it has termed "insufficient" funding mechanisms in the bill, which freezes the rates at which nuclear power plant operators collect money from ratepayers for the Nuclear Waste Fund.

The bill passed the Senate on February 10 by a vote of 64 to 34 and was approved by the House on March 22 by a 253 to 167 vote, both votes falling short of the two-thirds majority needed to override the presidential veto. The bill's sponsor, Sen. Frank Murkowski (R., Alaska), had indicated that he would be placing some pressure on lawmakers who plan to vote to sustain the veto. His efforts failed, however, and the 64-35 Senate vote to override the veto fell three senators short of the two-thirds majority needed to pass the bill.

A procedural move by Sen. Trent Lott is keeping the bill open, and it may be called up again later in the current session if it appears that more "yes" votes can be garnered.

Nevada Rejects DOE Permit Application for Water Use at Yucca Mountain; DOE Sues

In February, the state of Nevada rejected the U.S. Department of Energy's permit applications for water use at the Yucca Mountain project site. In early March, the DOE responded by filing an appeal in U.S. District Court in Las Vegas challenging the decision. The Justice Department also filed a notice of appeal in the state court. The DOE had submitted five permit applications to the state in 1997, in order to secure 430 acre-feet of water each year, beginning in 2002, for Yucca Mountain.

The state engineer, Michael Turnipseed, based his decision for denying the permit not on any technical grounds, such as the lack of available water to the repository site, but rather on the fact that state law bans the storage of high-level radioactive waste in Nevada.

The DOE lawsuit is based on the fact that federal law (in this case the Nuclear Waste Policy Act) preempts state law. Thus, the DOE complaint says, state law "stands as an obstacle to the congressional mandate . . . that the DOE continue activities related to the potential siting, construction and operation of a repository for storage of nuclear waste at Yucca Mountain."

Administration Proposes to Compensate Nuclear Weapons Workers for Work-Related Illnesses

Reversing a decades-old government policy of opposing worker claims that their illnesses resulted from hazards, nuclear or otherwise, associated with work in the nation's nuclear weapons program, Energy Secretary Bill Richardson announced a new Clinton/Gore administration initiative to begin compensating the men and women who developed illnesses from exposure to dangerous chemicals and radiation during their work in the nation's nuclear weapons complex.

"We are moving forward to do the right thing by these workers," Secretary Richardson said. "The men and women who served our nation in the nuclear weapons industries of World War II and the Cold War labored under difficult and dangerous conditions with some of the most hazardous materials known to mankind. This is a fair and reasonable program. It will compensate workers and get them the help they have long deserved."

The administration's proposal, if enacted into law by Congress, would compensate more than 3000 workers with a broad range of work-related illnesses throughout the DOE nuclear weapons complex, including beryllium-related illnesses, radiation-related cancers, and other occupational illnesses. Total programs costs, including administrative costs and worker benefits, are estimated to be about \$120 million annually over the first three years the program is fully operational, declining to about \$80 million per year after that as the backlog of claims is reduced.

Most of the workers who would benefit from this proposal have worked at the DOE's Hanford Reservation, Oak Ridge Reservation, Savannah River Site, Nevada Test Site, Rocky Flats Environmental Technology Site, Pantex Plant, Mound Plant, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Fernald Environmental Management Project, and the gaseous diffusion plants in Paducah, Ky.; Portsmouth, Ohio; and Oak Ridge, Tenn. Most of these sites are now running vast cleanup projects.

Further information about the proposal, including benefit summaries, is available on the DOE's web site at www.eh.doe.gov/benefits.

DOE Revises Plan for Idaho Waste Treatment Facility; Incinerator Construction to be Deferred

The U.S. Department of Energy has put on hold plans to build an incinerator to treat nuclear waste stored at the DOE's Idaho National Engineering and Environmental Laboratory (INEEL) as part of the Advanced Mixed Waste Treatment Project (AMWTP). Instead, the DOE will, upon issuance of required permits, proceed with the construction of a majority of the advanced mixed waste treatment facility at INEEL to process most of the site's existing stored transuranic (TRU) waste and will pursue regulatory options that

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may make incineration of the small quantity of remaining materials unnecessary.

The AMWTP is a cornerstone project for meeting DOE commitments to move the TRU waste out of Idaho by 2018, and includes designing, building, and operating a facility to prepare 65 000 cubic meters of plutonium-contaminated waste for final disposal at the Waste Isolation Pilot Plant in New Mexico.

Approximately 3 percent of the total waste will need some additional form of treatment, either incineration or an alternative treatment. But the announced incineration plan became the subject of litigation, with opposition groups demanding some \$1 billion in compensation should the incinerator plan go forward. Therefore, the DOE is also establishing a “blue ribbon” panel to explore alternatives to incineration.

The DOE hoped to begin construction this spring. The cost of building the facility is expected to exceed \$500 million; it should be operational by March 2003.

Spent-Fuel Shipment Safe, NRC Study Concludes

“Reexamination of Spent Fuel Shipment Risk” (NUREG/CR-6672), performed for the U.S. Nuclear Regulatory Commission by Sandia National Laboratory and released in late March, concludes that previous studies of spent-fuel transportation significantly over-estimated shipping risks. The previous study, “Final Environmental

Statement on the Transportation of Radioactive Material by Air and Other Modes,” NUREG-1070, had been issued in 1977.

In 1996, the NRC decided to reexamine the risks associated with the shipment of spent power reactor fuel by truck and rail. Drawing on updated experience and the latest analytical techniques, scientists and engineers have quantified shipping risks far more accurately. Among the new study’s conclusions:

- Old studies greatly overestimated the likelihood of shipping cask failures.
- Old studies overestimated radiation doses from truck and train accidents—single-cask truck shipment incident-free population doses developed by the new studies were about one-quarter of those in NUREG-1070, and single-cask rail shipment incident-free population doses developed were about two-thirds of those in NUREG-0170.

LLW Updates

- The U.S. Department of Energy in February released its final decision on sites for the treatment and disposal of government low-level and mixed low-level wastes. For LLW treatment, the DOE will continue the practice of each former defense nuclear facility treating its own waste. For LLW disposal, the DOE will continue onsite disposal at sites that already have LLW disposal facilities (Hanford, Idaho, Los Alamos, Nevada Test Site, Oak Ridge, and Savannah

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River) and will continue to use the Hanford site and the Nevada Test Site for disposal of LLW from other DOE sites that do not have disposal capacity. For MLLW treatment, the DOE will continue to use Hanford, Idaho, and Oak Ridge to treat waste from other DOE sites and will begin to use Savannah River to treat waste from other DOE sites. For MLLW disposal, the DOE will begin using the disposal facilities already constructed at Hanford and at the Nevada Test Site for offsite waste.

- The three-judge panel of the 8th U.S. Court of Appeals has ruled that there appears to be evidence that Nebraska officials interfered with the license sought by the Central Interstate Low-Level Radioactive Waste Commission, agreeing with a previous ruling by U.S. District Court Judge Richard Kopf. The panel also said that Nebraska can be sued because it gave up its sovereign immunity when it joined the compact.

Nebraska, along with Louisiana, Oklahoma, Arkansas, and Kansas, formed the Central Interstate Low-Level Waste Compact after the passage of the 1980 Low-Level Waste Policy Act. Nebraska was selected as the host for a disposal facility in 1987, and the site developer, US Ecology, originally submitted a license application for a site in Boyd County in 1990. The state indicated in 1993 that it would deny the application because of groundwater concerns, so US Ecology redrew the site boundaries and submitted a revised application. The state denied the second application, on the same grounds, in December 1998. At that point Omaha Public Power District and two other utilities sued Nebraska, alleging that the state had never had any intention of approving the license application and asking the state to pay them back their share of the more than \$90 million paid toward the project while state officials were reviewing the license application. They were later joined in the lawsuit by the compact commission and US Ecology.

The ruling is being closely watched by officials of the Southeast Compact, which has filed a similar suit against the state of North Carolina, and by those in California, where site development has encountered difficulties on both the state and federal levels (see "Safe Disposal of Low-Level Radioactive Waste: Statutory Process Versus Ad Hoc Committees," this issue, page 18).

The ruling has resolved one of two pending appeals of the original Kopf ruling by Nebraska. A ruling on the second appeal should be decided this summer.

New Cost and Schedule Estimates in DOE's Latest "Paths to Closure" Update

In mid-April, the U.S. Department of Energy issued an update to the 1998 *Paths to Closure*, its long-range plan for cleanup of the DOE nuclear weapons complex. The new report is based on data collected in 1999 and does not reflect certain funding increases granted in fiscal 2000 and requested in the FY 2001 budget.

According to the update, total cleanup costs are now estimated to be in the range of \$168 billion to \$212 billion.

Excluding the \$17 billion spent between 1997 and 1999, that leaves future costs of between \$151 billion to \$195 billion. (Note: These estimates also do not include the approximately \$35 billion spent on site cleanup from program inception in 1989 through 1996.) Of this, some \$10 billion is to be used for long-term stewardship. This number is up from \$5 billion in the 1998 estimate, mostly because in the earlier report, not all sites have come forth with stewardship cost estimates.

In addition to costs, the new DOE report revises cleanup schedules, with the result that some sites will take longer to clean up, while others will be closed early. For example, as the DOE has been reporting for more than a year now, remediation at the Rocky Flats Environmental Technology Site is scheduled to be finished in 2006, up four years from earlier estimates. The department also hopes to close the Fernald Environmental Management Project in 2006, two years earlier than previous estimates. On the other hand, the updated report shows that the West Valley Demonstration Project will close in 2015, 10 years later than earlier estimates.

The report notes that in a few cases where projects are facing delays and cost increases, the delays are caused by regulatory circumstances over which the DOE has little control. For example, the delay in opening the Waste Isolation Pilot Plant in New Mexico has lengthened the life cycle of the facility and thus increased the life cycle costs by some \$100 million. In other cases, discoveries of additional contamination have added to costs and schedule.

High-level waste projects account for nearly one-third of the low end of the cost estimate—more than \$50 billion of the \$168-billion estimate. The largest uncertainties and largest increases in cost since 1998 stem from the projects to treat and dispose of HLW, spent fuel, or excess nuclear materials at the Idaho National Engineering and Environmental Laboratory, the Hanford Site, and the Savannah River Site. According to the report, some of the increases are the result of the DOE's increased understanding of the full scope of work involved in managing and cleaning up these wastes. Other increases stem from the costs of developing new technologies found to be needed to complete the cleanup.

In conclusion, several broad implications for the future are summarized in the report:

- The DOE will continue to implement an accelerated site closure and completion strategy, to reduce costs spent on maintaining facilities.
- The DOE needs to consider applying site completion strategies to projects at sites with longer environmental missions.
- Sites need to continue to improve their understanding of work scope and uncertainties, to enable the DOE to identify and deploy better project management strategies.
- The DOE must continue to explore new ways to think about the largest, most complex projects.
- The DOE will continue to define and refine long-term stewardship requirements.

Copies of the report are available on the Internet at www.em.doe.gov/closure/. ■